Photonic ICs to pass $5bn by 2009

Since the introduction of photonic integrated circuits (PICs) in 1997, the optical components industry has slowly been migrating from the manual assembly of discrete optical devices to automated, semiconductor wafer-processing techniques and single-chip solutions.

Yet, in the last three years, the market has undergone a major realignment; about 75% of photonic chip makers have either merged or closed down since 2001; the carrier market has undergone a number of bankruptcies and consolidations; and a slowdown in equipment spending in the long haul market is not expected to rebound before 2006.

Amidst this repositioning, the market has emerged with product pipelines of market-ready advanced photonic chips and growing end-market demand. The materials used in the photonic elements are mainly ceramics and glass.

A new updated report from BCC, *Photonic Integrated Circuits: New Directions*, the market for PIC subsystems and components is currently estimated at $2.5bn. Expected to grow at an AAGR of 18.2%, this market is to reach nearly $5.7bn by 2009.

Separately, the market for discrete devices or integrated optical circuits will grow from a current estimated market value of $2.2bn to $4.9bn by 2009. The established transmission market (laser diodes, transmitters, photodiodes) comprises 77% of this market.

The market for subsystems, or PICs, will grow at an AAGR of 27.7% to reach $744m by 2009. In sum, these systems or optical systems-on-a-chip (SoC), will grow from 9% to 13% of the overall market for PIC subsystems and components during this forecast period.

PIC sales have experienced a slight generation lag due to the protracted slowdown in telecom equipment spending in 2001.

In the 2001-2003 recession, sales fell as much as 60% across optical component product lines as suppliers strived to work down excess inventories amidst bandwidth overcapacity. Yet the resultant focus on the bottom line has a silver lining. The value of higher performing, low-cost optical components in the network has increased.

Previous market forecasts underestimated the length and severity of the downturn in telecom spending.

The high debt loads of the carrier market and its inability to restructure in a timely fashion has weighed down on optical component sales. BCC believes the cycle low was reached in 2003.

The optical component industry is on track to grow 10% in 2004. A strong rebound will be driven by growth in Internet traffic and bandwidth intensive services, such as video on demand and gaming.

Higher growth in emerging markets includes the build out of networks in Asia and other emerging markets and the untapped potential in the metro and access markets.

Underpinning this forecast are a number of shifting dynamics affecting fibre optic telecommunications equipment spending. Specifically:

• DWDM (dense wavelength division multiplexing) has changed the telecom equipment spending business cycle. The rebound, gaining modest traction in 2004, will span 24 months while bandwidth overcapacity is worked down, giving a longer cycle downturn.

• The long-haul market buildout is nearing completion. Future demand growth will come from the metro and access markets, which will require more advanced yet lower cost components. These markets will grow at more than twice the rate of long haul over the next five years.

• New technology and services: Future growth will be tied to new services such as DSL rather than optical backbone buildout. These services are being rolled out at a faster clip, yet still below the well-funded boom by low-cost capital of the long haul market buildouts from 1995-2001.

• Sales growth will be driven by advanced next generation products being introduced to the market in 2004 and 2005.

GaAs faces double-edged sword

Strategy Analytics' five year outlook for the gallium arsenide microelectronics industry, "GaAs Industry Forecast: 2004-2009," concludes that riding the crest of a cellular handset upgrade wave, the industry cycle peaked in 2004. However, this very dependency on the cellular handset market will act as a double-edged sword in 2005, reducing industry growth to a crawl.

While other application areas, including WLAN and auto RADAR applications, will provide new opportunities for the GaAs industry, volumes in these markets will not grow to levels that free the market from cellular handset market dependency through 2009.

"We see market growth slowing to a crawl in 2005. This will be true for the whole vertical chain from substrates through to GaAs devices (MMICs, discretes and digital ICs)," predicts Asif Anwar, director of Strategy Analytics' GaAs and Compound Semiconductor Technologies service.

"Growth will start to accelerate again over 2006 and 2007, but the overall cycle is now spread over four years and the market will slow down again by 2009."

"The GaAs industry will grow out of the cellular handset 'habit,' but timing will depend on the speed at which other end applications develop", observes Stephen Entwistle, VP of the Strategic Technologies Practice at Strategy Analytics.

"In the meantime, although the revenue generated specifically from cellular handset GaAs PAs and switches will start to decline from 2007, GaAs technology will continue to be the key to unlocking additional growth streams for companies focused on supplying cellular handset RF front ends and complete radio solutions."